Cold *Pinguicula* in a Hot Climate

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If a terrarium-bound carnivorous plant were sentient, what it would think? How would it feel to learn that just a few leaf-lengths beyond the glass walls of its enclosure, a harsh and deadly environment ruled? Like a traveller in a spaceship, it relies upon a life-support system to transform a cruel landscape into a hospitable habitat.

The life-support systems horticulturists devise can create magical results. I have managed to grow carnivores in the hot, arid Sonoran desert of the USA's southwest. In this land, months pass without rain. For weeks, summer temperatures hover near 46°C (115°F). The sun burns deep into the gravel-floored desert. Animals exposed to the heat desiccate into leathery chunks that look like discarded winter hats. Yet in this environment I was able to grow boreal *Pinguicula*, and grow them well!

Figure 1: *Pinguicula leptoceras* halfway through a growing season.

Boreal *Pinguicula* are native to cold climates and require frigid winters to survive. During the cold season, these plants rest as tight buds called hibernacula (singular: hibernaculum). This dormant period can last many months—some of my plants from near the arctic circle rest for nine months of the year! If grown continuously and without seasonal variation, these plants would die within a year.

If you live in a non-arctic climate, growing boreal plants may appear difficult. How can you keep your greenhouse cold enough during the summer, and how can you artificially extend the winter to such a long period? If you grow plants indoors in terraria, your task may seem even greater since terraria are usually maintained year-round without seasonal variations—how could you possibly maintain a plant which absolutely requires seasonal changes? Worry not, for with just a few tricks, boreal carnivores are very easy plants to grow. The principle device you need to grow boreal plants is a little space in your refrigerator, for it is there your plants will rest during their dormancy.

Caring for these plants during their growing period is easy. Boreal *Pinguicula* species are not very large, so 5 cm (2 inch) pots are appropriate. I keep my plants in a 50/50 silica sand/peat moss mix. Their pots stand in purified water all the time, so the soil is moist. The lighting is partial shade—two or four fluorescent bulbs provide enough light. They are not fussy about temperatures during the growing season, anything less than 35°C (95°F) is fine. Fertilizer is not required as the plants usually capture enough fungus gnats to keep them happy (if I were to fertilize them, I would use a foliar spray of Miracid).

Every few weeks I look at the plants and try to detect signs of impending dormancy (Figure 1). If the plants stop producing full-size leaves, and instead form a tightly packed hibernaculum, I know dormancy is near. A few to several weeks after the hibernaculum forms, the summer leaves of the plant rot away, leaving a stringy

muck. Dormancy has arrived!

To prepare these plants for the long winter, I remove any weeds or rotten leaves, and examine the hibernaculum. Tiny lateral buds (gemmae) are often produced by the plant prior to dormancy, and these can be carefully detached and used to start new plants. These can be tiny, less than 1 mm long, so look carefully (Figure 2). I often place tiny bits of white plastic on the soil surface as markers so I do not lose track of these propagules. If I want to repot the plant (which I do every second year or so), this is the time to do it. After this preparation, I store the plant, pot and all, in a sealed plastic bag in my refrigerator. (At this point I note that not only is a refrigerator required, but understanding housemates are also necessary. Remind them that what you have in the refrigerator is not much different from onions or garlic. The nasty peat-filled pots require more creativity to argue around.)

Figure 2: *Pinguicula macroceras* subsp. *nortensis* hibernaculum bearing tiny gemmae.

If you grow your plants in a terrarium, you can encourage your plants to form hibernacula in the fall by decreasing the number of hours your fluorescent bulbs are on. Do not fret about matching the exact number of hours to some desired latitude on Earth, just change the photoperiod to about 75% of the summer value. I change my terraria from sixteen hours to twelve hours.

Once per month, take a look at the contents of each bag in your refrigerator (Figure 3). If you stored a pot that had a few large leaves still attached to some of the plants (an inevitable event when you have several plants in a pot), remove each leaf as it dies.

What you are looking for is the resumption of growth. First the hibernaculum will open—do not take the plant out of the refrigerator yet. Wait another few weeks first. Then return the plant to your growing area and stand back! The first few

Figure 3: Dormant *Pinguicula corsica* hibernacula, not quite ready for growth. Give them another few weeks of cold.

weeks of growth can be amazingly frantic, and you will be astonished at how quickly the hibernaculum will transform itself into a full, growing plant. If you are lucky enough for your plant to flower, it will do it early in the season. Then with surprising brevity, it will drowse back into dormancy. With such a short growing period, these plants may take a few years to reach flowering size, but are lovely little gems even when out of flower.

Now, one final trick for you to try. There is no reason for you to be constrained to grow your plants during the summer. If you store your plants in the refrigerator during your summer, you can grow them during the winter. The plants will never know the difference, and if you grow in a hot climate (as I do), your winter growing conditions may be quite like what your plant is expecting during its summer! It may take a few years to fully shift your plant to growing out of phase, but it is worth it—*Pinguicula* flowers during the winter are marvelously cheery!

Using your refrigerator, you can grow a variety of interesting species like *P. vulgaris*, *P. alpina*, *P. grandiflora*, *P. macroceras*, *P. corsica*, *P. longifolia*, *P. vallisneriifolia*, *P. leptoceras*, and others. Furthermore, the same method works well on the cold-climate *Drosera* like *D. rotundifolia*, *D. filiformis*, *D. stenopetala*, etc. I have even grown *Darlingtonia* and *Sarracenia purpurea* subsp. *purpurea*...all in the hot Sonoran Desert, a few meters from giant Saguaro cacti.

International Carnivorous Plant Society Seed Bank

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